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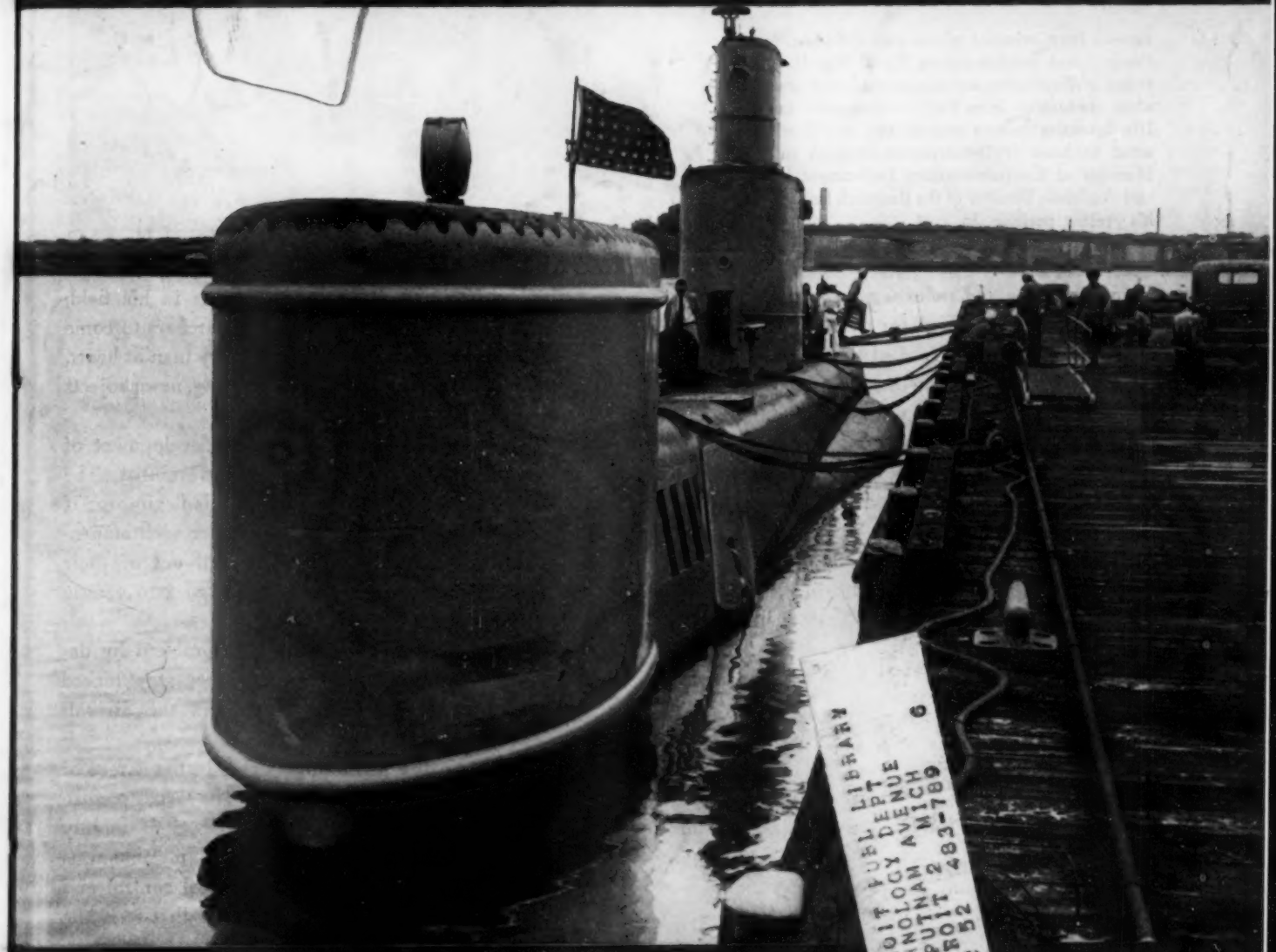
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

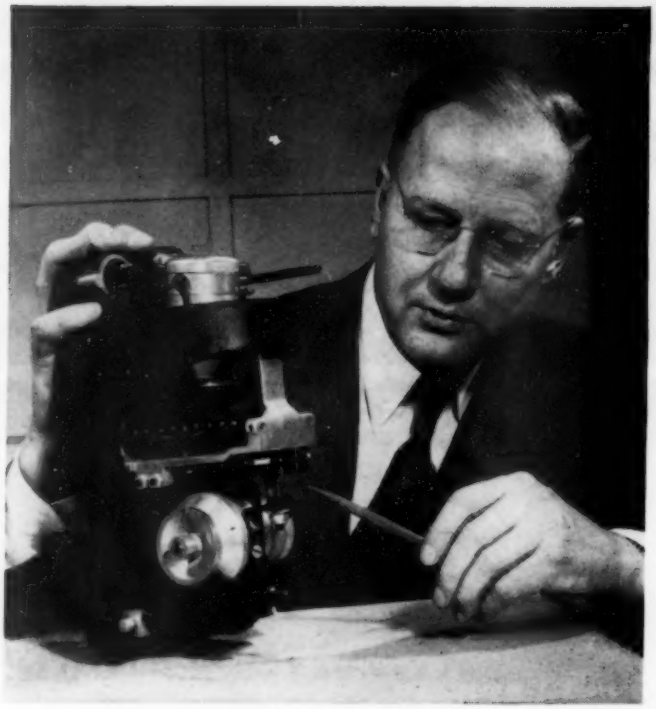


A SCIENCE SERVICE PUBLICATION

Adventurers in Research..

Dr. Clinton R. Hanna

SCIENTIST-INVENTOR



Hoosier-born scientist whose gun stabilizer revolutionized tank combat during World War II. He enrolled in Westinghouse graduate student course right after graduation from Purdue University in 1922. His inventive talents earned him rapid advancement to head of Development Division in 1930, Manager of Electromechanics Department in 1937, and Associate Director of the Research Laboratories, his present position, in 1944.

Where human muscles and reflexes aren't quite up to the job, the electromechanical regulator can do it many times faster and more accurately. Proof of that is in the career of Dr. Clinton R. Hanna, who has developed a whole family of these devices in his 30 years with Westinghouse. It was his gyroscope-controlled gun stabilizer that during World War II enabled Allied tanks to fire accurately even when traveling over rough terrain, and helped swing the tide of battle against the enemy in Africa. When heavy seas sent ship-based radar antennas bobbing erratically, Dr. Hanna designed a system for stabilizing them in the roughest weather. And when the U. S. Navy sought a way for submarines to lie perfectly motionless and quiet below the surface, Dr. Hanna was one of the men called upon to tackle the problem.

The soft-spoken, 51-year-old Westinghouse scientist has some 100 patents to his credit in the field of regulators. One of his earliest was a device for controlling the speed of steel mill roller motors. Strangely enough, it was this device which led a visiting Army officer to wonder if the same principle could be applied to stabilizing tank guns. Dr. Hanna thought it could and proceeded to prove it. Now an improved version for modern U. S. tanks is on the production line.

Quiet and methodical, the Westinghouse scientist likes to probe for new and difficult applications in his field, isn't swerved by the failure of previous searchers to come up with the right answers. Still a laboratory man at heart, he spends as much time looking over budding, new projects as he does at his associate director's desk.

Dr. Hanna's latest achievement is the development of an automatic pilot with unlimited maneuverability. The conventional autopilot just doesn't have this flexibility; if called upon to perform loops, rolls, or other such maneuvers, its gyroscopes will "tumble" or fall out of their original alignment, causing the plane to go into erratic and dangerous gyrations.

The Westinghouse scientist solved the problem by devising three non-tumbling gyroscopes that stay locked to the plane no matter what maneuvers the aircraft employs.

These are but a few of the high lights in the career of "Clint" Hanna, adventurer in research. The larger picture should certainly include many other contributions, mainly those that have aided in the improvement of numerous Westinghouse products that feature electrical control and regulation. They make it abundantly clear that it is the know-how and experience of scientists like Dr. Hanna which are the cornerstones of industrial progress. Westinghouse Electric Corporation, Pittsburgh, Pennsylvania. G-10228

YOU CAN BE SURE... IF IT'S Westinghouse

ARCHAEOLOGY

Soil Chemicals Tell Site Age

Geochemical method for dating sites too old for radiocarbon determination is suggested. Based on man's enrichment of soil chemicals by garbage and other refuse.

➤ A NEW geochemical method for dating sites occupied by man in the ancient past has been suggested by scientists in Baltimore, Md., as useful for remains so old as to be beyond the 25,000-year limit of radiocarbon dating.

This method is based on the fact that wherever man makes his home, he enriches the soil through his garbage and other refuse with greater proportions of such chemicals as copper, zinc, tin, lead, gold, manganese and, of course, phosphorus and nitrogen. Thus the site of human occupation is richer in such minerals than unoccupied sites of similar geological character.

With the passage of time the difference tends to dissipate and the chemical makeup of the soil is more like that of neighboring unoccupied areas. Unfortunately, the dissipation does not occur at a regular rate but varies with such factors as the original character of the soil, topography and climate, so it is not possible to ascribe any pin-point dating to a particular site with this geochemical method.

Scientists do hope to be able to use it, however, to find out whether a particular prehistoric campsite is only 1,000 years old, is 10,000 years old or even 100,000. Trial of the method indicates that it shows up a difference of only 1,000 years between two sites from 1,000 to 3,000 years old.

The despised trash heap onto which man for many ages has dumped his gnawed bones, broken dishes, worn-out tools and other refuse has always been a treasure horde for archaeologists. The archaeologist calls such a dump a "midden."

Now the midden promises to have new usefulness. Chemical analysis of its composition may serve to check the archaeologist's own way of dating through study of the design of tools, patterns of pottery, evidence of the people's occupations and so on.

First test of the new method is reported in SCIENCE (July 4) by Dr. V. P. Sokoloff and Dr. G. F. Carter, of the Isaiah Bowman School of Geography, Johns Hopkins University.

Study was made of two sites in Florida for which dates had already been found on the basis of the design of pottery fragments. One site was 1,000 to 2,000 years old; the other 2,000 to 3,000 years old.

Extractable copper in the subsoil midden materials, it was found, is significantly higher in both than in non-occupied sites, but in the older site the concentration is much more like that of the comparison soil.

"It is shown conclusively," the report states, "that, in Florida, a period of 1,000 or 2,000 years is not enough to bring the distribution of trace minerals in a midden around to that in a comparable undisturbed site."

Further work is needed to test their method and "the problem is posed rather than solved in this preliminary investigation," the scientists conclude.

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ENGINEERING

Tire Tests Tell The Best Buys

➤ SCIENTISTS AT the National Bureau of Standards are helping the government buy better automobile and truck tires by improving ways of predicting tire performance.

The whole program is designed to save the United States money. The life of a tire made by one manufacturer may be 12,000 miles. A similar tire made by a different company may last 41,000 miles.

Under the direction of Dr. R. D. Stiehler, the scientists have improved their power-loss, carcass and tread tests that disclose the tire's weaknesses.

The power-loss test shows how much engine power is absorbed by the tire and turned into heat. Sometimes the tires become hotter than the temperature at which they were vulcanized. When that happens, deterioration sets in rapidly.

The carcass test measures fatigue resistance of the tire. It has been found that tires with high power-loss generally have poor fatigue resistance, and that tires made with cotton cords deteriorate much faster than those made with rayon or other synthetic fibers.

The tread test reveals the wearing qualities of different treads. Among other things, it shows whether small cuts in the tread will grow rapidly to serious proportions.

In addition to causing tires to become hot, power-loss also runs up gasoline bills. Heat generated in tires represents energy developed by the motor that otherwise would go into moving the automobile.

Since most passenger cars have a surplus of power, the problem there is not serious. But when trucks and especially tractor-trailers have as many as 18 tires, the wasted engine power is particularly noticeable. It may mean shifting gears on a hill.

Power loss is influenced by both composition and design of the tire. Because of the power-loss increase when synthetic rubber is substituted for natural rubber, large truck and bus tires at present must be made largely of natural rubber. However, elastic types of synthetic rubber currently are being sought after that will have lower power-loss.

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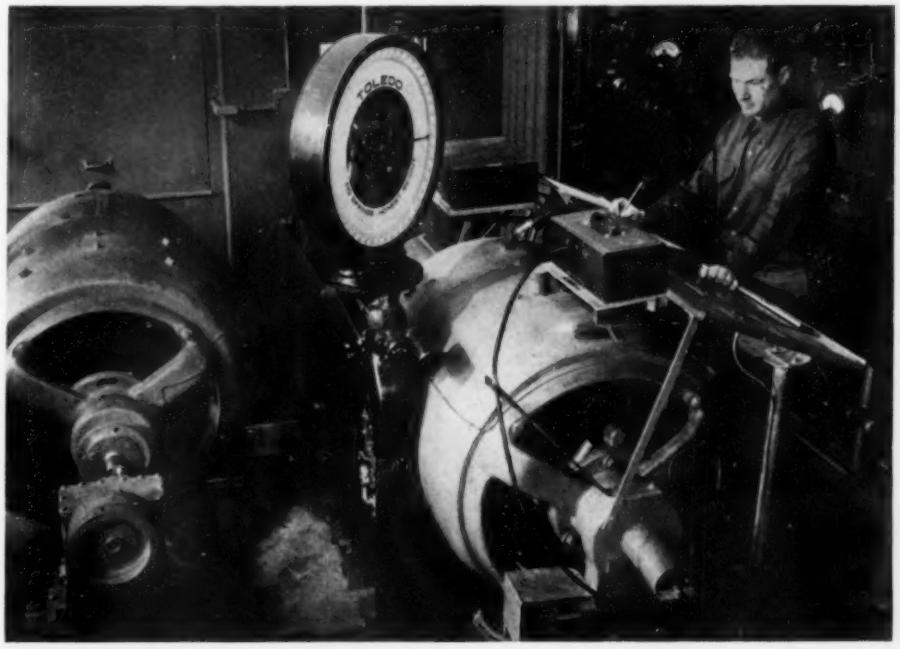

TIRE POWER LOSS TEST—The tire under test at the National Bureau of Standards' dynamometer installation is contained in the temperature-controlled enclosure in the background. The dynamometer at the right measures the power required to drive the tire while the one on the left measures the power transmitted by the tire to a steel drum.

AERONAUTICS

Flying Nine Times Safer

➤ IT IS nine times safer to fly today than it was in 1931, Adm. E. S. Land, president of the Air Transport Association, reported in Washington, D. C.

His conclusion is based on awards just issued by the National Safety Council to 41 U. S. scheduled airlines in recognition of their contributions to safe air transportation in 1951.

The Admiral's statement may seem contradictory to one made recently by Harry F. Guggenheim of the Cornell-Guggenheim Aviation Safety Center. He said that flying is no safer now per passenger mile than it was five years ago.

Adm. Land's statement is based on a comparison of fatalities in flying on scheduled airliners in each of the four five-year periods since 1931. Mr. Guggenheim's figures are based on recent accidents compared with those of five years ago.

Figures used by Adm. Land are those of the U. S. Civil Aeronautics Board and do not include accidents to planes flown by individuals or companies which do not operate on definite schedules. Fatalities of scheduled airlines have dropped from 15 per 100 million passenger miles in the five-year 1932-6 period to 1.7 for the five years 1947-1951.

In Mr. Guggenheim's statement, he acknowledged that the number of accidents have been cut in half, but fatalities are at about the same level today as five years ago because today's larger planes carry greater passenger loads. He is head of an organization that is trying to stimulate the cooperation of all agencies in making flying the safest form of transportation.

The annual awards made by the National Safety Council, with headquarters in Chicago, go only to domestic, territorial and overseas carriers which fly scheduled runs. The 41 which received recognition include 15 trunk lines, 11 territorial lines and 15 feeder lines.

To qualify for an award, any one of three ways was required. An airline could have completed the year 1951 without a fatal accident; flown 2,000,000,000 consecutive passenger-miles without a fatality, or completed five or more consecutive years of safe operations, even though an accident terminated its record in 1951.

Science News Letter, July 19, 1952

NATURAL RESOURCES

Survey for African Oil

➤ AFRICA IS foreseen a larger source of petroleum in a report issued by the U. S. Geological Survey which covers an extensive area in northeastern Kenya.

No drilling has yet been undertaken, no seepages of oil or gas have been found, but petroleum geologists engaged in the survey have come to the conclusion that this Kenya area is a reasonably good petroleum prospect.

The survey, in which F. M. Ayers of the Geological Survey took part, was made possible by the Economic Cooperation Administration and the British Colonial Office.

Geologists had previously shown some interest in this region for oil and gas possibilities. Oil exploration licenses were issued to British concerns just before World War II but very little was done. ECA assistance made the intensive survey possible.

Africa today produces relatively little petroleum, the more active wells in existence being in northern Egypt. Kenya is an equatorial country south of Ethiopia and Somalia and bordering on the Indian Ocean. The region explored is a large primitive area of some 17,400 square miles known as the Wajir-Mandera district. The survey included both field work and aerial mapping.

A drilling program is advised by Mr. Ayers in his report. Four locations are suggested for drill-hole sites. An important prerequisite to the discovery of petroleum in this area is the establishment of the presence of a thick series of sediments, the report states.

Equipment for drilling should be of the type that would make a hole approximately six inches in diameter to a depth of 5,000 feet. The Kenya government is prepared to consider applications for concessions in the area studied.

Science News Letter, July 19, 1952

MEDICINE

Spot Anemia Victims With Stomach Test

➤ EARLY RECOGNITION and treatment of pernicious anemia, aided by an easy-to-take stomach test, should become "practically universal," Dr. William P. Murphy of the Peter Bent Brigham Hospital, Boston, predicts in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (July 5).

The test is a chemical test for stomach acidity. Victims of pernicious anemia have no acid in their stomachs and the simple test makes it much easier to discover this lack.

The patient does not have to swallow a stomach tube, the usual method for checking on stomach acidity. All he swallows is about half a teaspoon of an "indicator compound," a cation chemical containing a quinine derivative. Tests of the urine, collected hourly for two or three hours after taking the chemical, tell whether or not the patient has acid in his stomach.

This test simplifies the problem of diagnosing pernicious anemia, Dr. Murphy reports. And with present knowledge of how to treat the disease through the use of liver and its extracts, it is possible to prevent the occurrence of the most incapacitating and hazardous features of the disease which result from the destruction of nerves of the central nervous system.

The stomach-acidity test was developed by Dr. Harry L. Segal and associates of the University of Rochester School of Medicine.

Science News Letter, July 19, 1952

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PSYCHOLOGY

Conventions on TV

Political speakers of the Republican and Democratic parties, aiming their oratory both at delegates and viewers across the nation, influence the latter more.

➤ FOR THE first time on a nation-wide television hook-up the ordinary American voter is seeing for himself the bursts of enthusiasm with which convention oratory is greeted.

He can watch on television the "demonstrations" of perspiring delegates, raucously cheering, and carrying bobbing banners up and down crowded aisles.

The floods of extolling speeches, recounting the virtues of each candidate as he is nominated, are aimed not just at the ears of the hard-boiled delegates. They are directed to the voter himself, listening and watching in his easy chair at home and at the same time making up his mind how to vote in November.

The delegate is known to party leaders as a "20-minute egg." He is not much swayed, really, by convention oratory. He comes to the convention with his vote pledged to a certain candidate; leaders can count well in advance the votes they are sure of.

The element of uncertainty in the convention is due to those delegates who are pledged to a "favorite son"—someone who has strong support in his own state, but is not well known elsewhere. At a critical moment, these delegates swing to one or the other of the leading candidates, but these "deals" are probably cooked up in some smoke-filled room away from the eye of the television camera.

It is characteristic of the American voter, and of the American politician that he likes to be on the winning side. For this reason the "band wagon" appeal is a much-favored psychological device.

Each candidate tries to show that he is bound to win. There is much talk about nomination on the first ballot. This is undoubtedly the purpose of the shows of strength in preliminary committee meetings—trying to convince everyone that the outcome is a foregone conclusion.

But a nomination for president is seldom determined on the first ballot, as it was in the case of Gen. Dwight Eisenhower. There is usually a great deal of haggling, boasting, pleading and arguing before the business is done.

Events are much more powerful in determining the outcome of a convention or an election than are words. If the cold war with Russia should suddenly turn into a hot war, if a break in the stock market should bring with it a business depression, even a paralyzing nation-wide strike might cause a complete change in the picture.

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PSYCHIATRY

Homesickness in Reverse

➤ SOME MEN go through the hardships of war in Korea and distinguish themselves in combat without a sign of war neurosis only to break down when they return home.

This kind of homesickness in reverse was found to occur in seven out of a hundred cases treated at the Veterans Administration Mental Hygiene Clinic, Hartford, Conn. It has been named "nostopathy" which means "disease on return."

First symptoms of this homecoming illness sometimes struck the men when they received orders to go home or when the ship entered San Francisco harbor. As they approached the end of the journey, the illness might develop into an actual psychosis with delusions and hallucinations. They become tense, irritable and depressed. They may get into trouble with police. They develop stomach ulcers.

Study of the homes to which the patients were returning showed that they were cold; the men complained of lack of affection from parents and from brothers and sisters or wife. Some homes had been changed during the patient's absence by death, marriage, or by the birth of babies. Some men had married just before leaving or were expected to marry upon their return and faced the task and responsibility of setting up a new home. Some had become fathers.

Some were returning to unchanged homes but remembered only unhappiness there. In fact, they had enlisted to get away from home.

Nostopathy is not blamed entirely on the home by the physicians who report it in the AMERICAN JOURNAL OF PSYCHIATRY (July), Drs. Richard Karpe and Isidore Schnap. The nostopathy patients had had extensive combat experiences and had endured the hardships at the front longer than others. They had all adjusted to the life well and had not broken under it. But nevertheless, the severe strains they went through may have damaged their ability to adjust to life as a civilian, the doctors conclude.

Nostopathy is not confined to returning veterans. It may also affect those coming home after a long time in a hospital or prison.

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QUADRUPLE AMPUTEE — Cpl. Robert L. Smith, the first quadruple amputee of the Korean conflict, is seated behind the wheel of his specially-equipped automobile. He recently traded his Army uniform for a civilian suit, then drove from the Walter Reed Hospital, Washington, to his home in Middleburg, Pa.

INVENTION

Hand-Controlled Auto For Legless Persons

➤ VETERANS AND others who have lost legs may operate so-called clutchless or hydraulic clutch type automobiles with new hand controls invented by Raymond K. Wilson, Louisville, Ky.

Both the throttle and the brake are controlled by the same handle in this invention, so the driver can control both with one hand. Moving the handle from side to side moves the accelerator pedal, pushing the handle forward, pushes the brake on.

The handle is linked mechanically to the accelerator and brake foot pedals so it is not necessary to have the automobile in operation to operate the controls. Mr. Wilson received patent number 2,602,348.

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PSYCHOLOGY

Machines to Correct Errors of Operators

➤ IT MAY be possible some day to design complicated machines, such as airplanes, so they will correct for normal errors made by men who operate them, if research under way at Indiana University, Bloomington, is successful. Psychologists there hope to find formulas for human muscular responses, to design machines to "filter out" human errors, just as the steering mechanism of an auto "filters" the tremors of the driver's arms so they have no effect on the wheels.

Science News Letter, July 19, 1952

MEDICINE

Suggestion Aids Coughs

Mere act of taking a cough remedy may serve to stop the hacking. Ether and peppermint water were most consistent cough provokers used in tests.

➤ BY SPRAYING ether and peppermint water right into the windpipe of a man who had been "treated" with an injection of common salt water, Dr. B. R. Hillis, of Glasgow University Medical School, has shown that the mere act of taking a "cough remedy" may often serve to stop a cough by the power of suggestion.

Dr. Hillis's unique experiments, reported in the journal LANCET, were made possible because he found a man who was willing and able to slip the nozzle of an atomizer over the back of his tongue down into his lower pharynx and keep it there for hours. This enabled the doctor to spray an irritant directly into the pharynx to induce coughing.

Ether and peppermint water were found the most consistent cough-provokers. After noting the amount of coughing which followed spraying without prior treatment, Dr. Hillis at various times injected or dosed his human guinea pig with different anonymous "cures" and noted the cough-suppressing effect of each.

When he injected his subject with physiological saline, a very weak solution of ordinary table salt in water, the doctor found that the mere fact that the patient thought he had been doctored was enough to cause a marked lowering in his coughing. In three separate sets of experiments the weak salt solution "cured" the patient of 10%, 28% and 62% of his coughs following ether spraying.

Taking into account this psychological factor, Dr. Hillis then tested a number of drugs for their effectiveness, both by mouth or on injection, in stopping a cough.

His most surprising discovery was that codeine, widely used in medical practice to suppress coughing, was practically no more effective than the salt water, leading to the suspicion that the cough-stopping effectiveness of codeine may be due almost entirely to the faith people have in it.

The most powerful cough-suppressant of the drugs studied was heroin, which reached 100% effectiveness in some experiments, but this drug also caused moderate to severe drowsiness nine times out of ten.

Morphine and a comparatively new drug, amidone, were also found to be potent cough-stoppers and produced less severe drowsiness than heroin.

Dr. Hillis points out that all the three effective drugs are classed as habit-forming and must be used with caution.

"Admittedly it would be unwise to use heroin for chronic cough," he says, "because of the risk of producing addiction."

But he thinks there is "some justification for using heroin as a cough-suppressant for short periods in selected cases, especially where a troublesome cough has not responded to other opiates."

Science News Letter, July 19, 1952

INVENTION

Patent Atom Model With Moving Electrons

➤ A MOVING model of an atom has been invented by John B. Underwood, Grass Valley, Calif. Its patent number is 2,601,729. In the invention, balls representing electrons move around a central nucleus. The inventor wants to demonstrate the movement of the particles composing the atom.

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• RADIO

Saturday, July 26, 1952, 3:15-3:30 p.m. EDT

"Adventures in Science," with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Mr. Faber Birren, color research expert and color consultant, New York, discusses "Color and People."

MEDICINE

Authentic Temperature 114° F., Patient Lives

➤ ONE OF the highest rises in temperature authentically observed in a human being is reported in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (July 5) by Drs. Alfred A. Fracchia and Alexander Brunschwig of New York's Memorial Hospital Center for the Treatment of Cancer and Allied Diseases.

The temperature rose to 114 degrees Fahrenheit, rectally, in one of their patients, a woman with a carcinoma, and the patient lived. The elevation in temperature, checked with three thermometers specially calibrated in the laboratory, was very brief, and the patient recovered fully.

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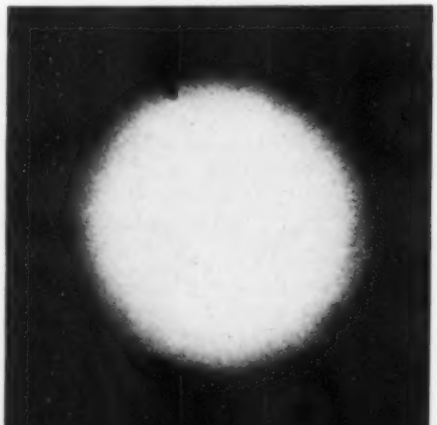
PHYSICS

Electrons Near Light Speed

➤ A SPEED never before attained by man-accelerated matter, only one-tenth of a mile per second slower than light, has been reached in the synchrotron at the California Institute of Technology, Pasadena. The velocity of light is 186,000 miles per second, and nothing can move faster.



X-RAY "FOOTPRINT"—Electrons from the synchrotron at the California Institute of Technology, accelerated to energies of 460 million electron volts, bombarded a lead plate, producing the world's most energetic X-rays and giving this "footprint" on film.

Record electron and X-ray energies were also scored, reports Dr. Robert F. Bacher, chairman of the physics division and director of the eight-man team cooperating on construction of the machine with the Atomic Energy Commission.

In preliminary operations, energies of 460 million electron volts have been reached, Dr. Bacher said. At this energy level, the electrons were more than 900 times heavier than electrons at rest, in accordance with Einstein's relativity theory.

When a one-eighth inch thick lead plate was put in the path of the electron beam, 460-million-volt X-rays were created, the most energetic ever produced by man. Energy output of the synchrotron will be raised to 500,000,000 volts this summer and later to around 1,000,000,000 volts.

Electrons are tiny particles of matter carrying a negative charge of electricity. They must be taken to higher speeds than the 1840-times-heavier protons, which are positively charged, in order to reach great energies. The cosmotron at Brookhaven National Laboratory, Long Island, N. Y., thus achieved energies of 2.2 billion volts in June by speeding up protrons to 177,000 miles a second. (See SNL, May 31, p. 341.)

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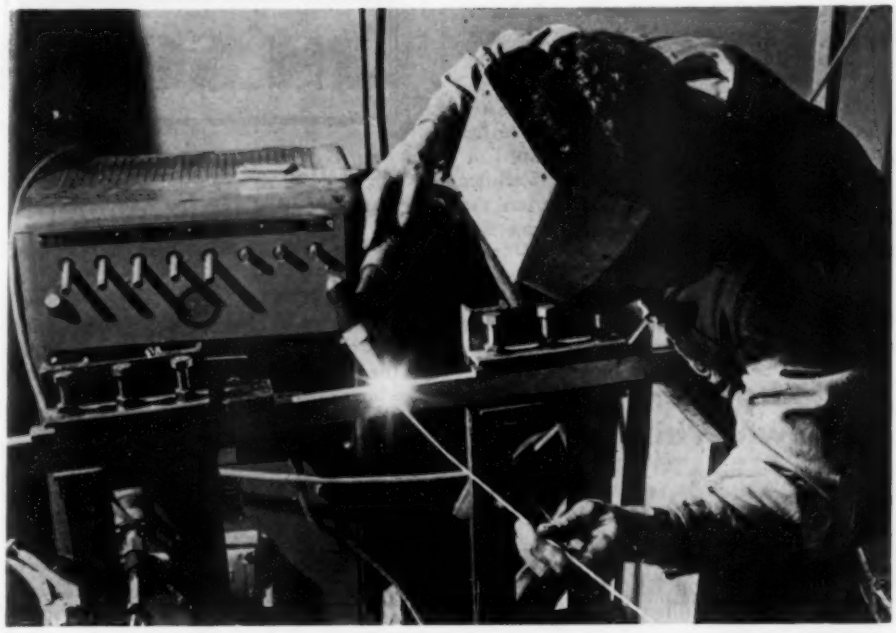

NEW LABORATORY EQUIPMENT—The welder shown here is working on the installation of electrical equipment in the new laboratory of the Research School of Physical Sciences of the Australian National University in Canberra.

PHYSICS

Atom Smasher in Australia

➤ AN ATOMIC accelerating machine that may help to reveal what holds together the particles of an atomic nucleus is to be installed at the Research School of Physical Sciences now under construction in Australia near Canberra.

The machine was invented by Prof. Marcus L. E. Oliphant, Australian-born physicist who distinguished himself at Cambridge's Cavendish Laboratory as one of the discoverers of triple-weight hydrogen, believed to be an important ingredient of the H-bomb.

Prof. Oliphant expects the massive instrument, when fully completed in 1955, to accelerate particles to more than 2,000,000,000 electron volts. It also may help scientists learn more about mesons, particles that have been detected in cosmic rays.

Called a cyclo-synchrotron, the machine works like this:

Atomic particles are shot into a steady magnetic field from the center of the machine. The particles travel in near-circular paths between poles of a powerful magnet. Each time the particles go around, they are accelerated twice. That increases their speed and widens their circular paths.

In the final orbit, the particles are speeded further by a small voltage applied while they are held at a constant radius by a strong magnetic pull toward the center of the machine. In such a way, particles may be accelerated to an energy of 2,000,000,000 electron volts, Prof. Oliphant figures.

A part of the Australian National University, the Research School of Physical Sciences itself is as new as the cyclo-synchrotron. The school will be divided into departments of astronomy, geophysics, theoretical physics and nuclear physics. Each department will be headed by experts in their fields. The school also will provide facilities for Australian graduate students who otherwise would have to go overseas for similar research training. Prof. Oliphant will direct the laboratory work.

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BIOPHYSICS

Radioiodine Slows All Body Processes

➤ RADIOACTIVE IODINE not only destroys thyroid cancers with its deadly rays but also shuts off the supply of thyroid hormone to slow down all body processes.

In the slowed-down, or myxedematous, state, certain tumors accept the radioactive iodine with its lethal rays, when previously they would not do so, Dr. Earl R. Miller, radiologist at the University of California Hospital, San Francisco, reports to the American Cancer Society.

The growth of some other tumors is retarded under the radioiodine treatment, even when there is no evidence that the tumors take up the chemical and its exploding atoms.

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STATISTICS

Marriages and Divorces Lowest in Decade

➤ BOTH MARRIAGES and divorces in 1951 hit the lowest point in over ten years, the Public Health Service of the Federal Security Agency has reported.

A total of 1,594,900 couples were married last year, a 37% drop from the 1946 all-time peak and 6% less than in 1950. Marriages last year dipped because the number of single persons of marrying age was reduced, due both to the low birth rates during the early 1930's and to the previous high marriage rate level.

An estimated 371,000 divorces were granted in 1951, compared to 385,100 in 1950. Since the 1946 all-time peak, the divorce rate has dropped 44%.

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INVENTION

Streamlined Seaplane Has Pivoting Step

➤ A PIVOTING step for seaplanes has been invented by Peter R. Crewe, Shanklin, Isle of Wight, England, and assigned to Saunders-Roe, Ltd., Osborne, East Cowes, Isle of Wight. Patent number is 2,601,835.

The invention provides a hull for seaplanes which is generally of streamline form rather than the usual form made for floating on the water. The step is in the bottom of the hull near the center of gravity. It pivots to provide a straight-lined hull when in flight or to make a step which reduces the water drag on the hull during takeoff.

Science News Letter, July 19, 1952

MARINE BIOLOGY

One-Celled Creatures Cause Red Menace

➤ THERE IS a "red menace" threatening Chesapeake Bay. This particular menace, however, is not Russian-inspired.

It is due to the sudden appearance of large areas of red-colored, one-celled organisms that are near the borderline between plants and animals, down about the bottom of the evolutionary scale. An individual organism is much too small to be seen with the naked eye, but under favorable conditions, the cell splits in two very rapidly, becoming so abundant in a few hours that the color is visible.

The single-celled organism is plant-like in that it can manufacture its food from the simple substances dissolved in sea water, and animal-like in its power to gobble up other small plants and animals and its ability to swim by means of whip-like appendages extending from the body.

Marine biologists at the Virginia Fisheries Laboratory, Gloucester Point, Va., have identified the microscopic organism responsible for the discoloration of Chesapeake Bay water as *Cochlodinium catenatum*.

Science News Letter, July 19, 1952

TECHNOLOGY

Gas Turbine Engine Suits Ocean Vessels

➤ A RECENT round-trip across the Atlantic made by a British tanker powered by a gas turbine engine indicates that this type of power plant is suitable for ocean vessels and that it some day may replace diesel engines in marine services.

The 12-250-ton tanker, the AURIS, is said to be the world's first merchant ship fitted with a gas turbine. Its recent trip was made from England to the Caribbean area and, although equipped with other engines, it used the gas turbine alone.

Gas turbine engines already power small boats of the American armed forces, are used in airplanes and, experimentally, in automobiles and an American locomotive. They are in wide use in stationary power plants.

The so-called turbo-prop propulsion in modern airplanes makes use of a gas turbine which drives conventional bladed propellers. Turbo-jet propulsion utilizes a similar engine but forward movement is provided by the discharge of high-pressure gases to the rear.

Advantages of the gas turbine engine are small size, efficiency and economy. It gets more useful power out of the fuel consumed than engines of other types, and can use various types of liquid fuels. The recent trip of the Auris was made on heavy boiler oil. Engines of this type need no water, a definite advantage on shipboard.

Science News Letter, July 19, 1952

INVENTION

"Biostrategy" Used In Bacteria Fight

➤ "BIO-STRATEGIC" WARFARE against harmful bacteria can be conducted by a new three-way antibiotic preparation recently patented.

During the government's 1952 fiscal year, 46,531 invention, design, reissue and plant patents were issued. This compares with 50,250 in the preceding year and a record year, in 1932, of 55,709.

Hermann Vollmer, New York, the strategist of the three-way attack on bacteria, assigned his patent, number 2,602,038, to Sharp and Dohme, Inc., West Point, Pa., a drug firm. His preparation consists of a combination of three "wonder drugs," sulfadiazine, penicillin and sulfamerazine.

Mr. Vollmer explains that the three drugs enter the blood stream in succession and reach their highest blood concentration at different times. The sulfadiazine, getting there first, kills off the weaker strains of bacteria, but the stronger strains adapt themselves to sulfadiazine. However, the bacteria are, at the same time weakened against the following, unexpected attack from penicillin.

The bacteria, Mr. Vollmer says, are like military forces which have been trained for tropical warfare but are sent to the Arctic. They would be less able to resist the cold of the north than troops without training for the tropics.

The few remaining bacteria that survived the penicillin attack, according to the inventor, are knocked out by the third attack with sulfamerazine. Mr. Vollmer claims this is distinctly different from the conventional method of administering two drugs at a time. The conventional way aims at a simultaneous knockout, while the new method is a one-two-three affair.

Science News Letter, July 19, 1952

ENGINEERING

Efficiency Pioneer Says Sit Down While Working

➤ SIT DOWN while you work. Use your head. Figure out how to make your work come to you.

That advice was given the American Society for Engineering Education, Hanover, N. H., by Dr. Lillian M. Gilbreth of "Cheaper by the Dozen" fame.

The efficiency pioneer said life can be easier for everyone if industrialists and homemakers apply to their own work some of the ideas that simplify work for handicapped persons. The reverse also is true.

The demand is for adjustable sinks, movable walls, lightweight household equipment and multi-purpose appliances, she said. It shows that today's husband does not want the kitchen to kill his wife—or himself, as the case may be.

Flexibility and teamwork are the work-simplification principles sought by engineers, home economists, doctors, the Red Cross and others working on the problem, she said.

Flexibility often means taking advantage of all three dimensions, making things below you as easy to reach as the things around you. Wheel chairs, for instance, should be adjustable up and down. A person then could fix the seat so he could reach the wheels more easily.

Teamwork is required between persons working with handicaps and persons simplifying operations in mines, offices, stores and schools.

"And remember," Dr. Gilbreth said, "some of the best ideas and methods come from the homes of America."

Science News Letter, July 19, 1952

INVENTION

Remote Controlled Radio and TV Patented

➤ A NEW method of controlling the tuning and volume of a radio or television set from across the room has been invented by Loy E. Barton, Princeton, N. J., and assigned to the Radio Corporation of America. He received patent number 2,602,851.

In his invention the remote control connectors are attached in series in one of the power supply leads.

Science News Letter, July 19, 1952

IN SCIENCE

PUBLIC HEALTH

Low Cost Clinic in Jeep Is Doctor's Bag on Wheels

➤ THE FIRST completed clinicar, a jeep pick-up truck converted into a small and reasonably priced clinic, was put on display in the lobby of the new State Department building in Washington recently.

Designed especially for Point Four health and sanitation officials, the clinicar costs $6,000 compared to the $30,000 for the larger, more elaborate mobile health units. Although originally intended for use in Libya, the "doctor's bag on wheels" is expected to be in demand in other countries where the services of a limited number of trained medical personnel must be spread over the widest possible territory.

The clinicar can take all the essentials necessary to a small clinic over desert roads, or even no roads at all, to speed up immunizations, vaccinations and other forms of preventive medicine. The sides of the clinicar have been built so that they convert into two "flaps," the lower providing a work shelf, the upper extending from the body of the car to form a roof.

Patients do not enter this mobile clinic for treatment as they do in the case of more elaborate healthmobiles. Instead, a tarpaulin can be carried from the roof of the car to extension poles to provide a shelter area large enough for an emergency operation.

Science News Letter, July 19, 1952

MEDICINE

Strep. Germ Chemicals Heal Difficult Operations

➤ TWO CHEMICALS made from germs can be used to speed the healing of troublesome wounds of the lower intestinal tract following removal of cancer.

Successful use of streptokinase and streptodornase, chemicals made from hemolytic strep. germs, is reported by Drs. Oliver H. Beahrs and George L. Jordan, Jr., of the Mayo Foundation. The blood clots, pus and other waste products of the operation are liquefied by the chemicals when they are injected four to six times beginning three days after the operation.

Complete healing of such operations involving resections has taken three to six months or longer heretofore. But with the two chemicals, which have been used by other surgeons in the past couple of years to aid healing of other infected wounds, the patient is completely well usually in about three weeks.

The two strep. chemicals do not act like antibiotics to check the growth of disease germs, but may be used with antibotics.

Science News Letter, July 19, 1952

E FIELDS

VETERINARY MEDICINE

X-Disease in Cattle Traced to Chemical

➤ ONE OF the causes of "X-disease" which infects and shrivels cattle, hardening their skin, has been discovered, the U. S. Department of Agriculture has reported.

The cause was identified by researchers at the University of Tennessee state experimental station as chlorinated naphthalene compounds. These are infrequently found in wood preservatives, although it is believed that the compounds are not being used in preservatives at the present time.

Other causes of the disease have not yet been identified, although there is evidence they might be found in a petroleum lubricant and several livestock feeds. "X-disease" is known to scientists as hyperkeratosis.

Thousands of cattle have died of the disease since it was first recognized in 1941. It has caused serious loss of meat, milk and other products in every cattle-producing area.

Science News Letter, July 19, 1952

PUBLIC HEALTH

Take It Easy In Vacation Sun

➤ MANY A city dweller's idea of a good vacation or summer weekend holiday is to take it easy in the sunshine. Taking it easy is a fine vacation idea, but remember to take the sun easy, too, or you may end up with long hours of suffering from sunburn or an accident because the sun affected your eyesight for night driving.

Many people forget that a burn is a burn, whether it comes from an atom bomb explosion or the sunshine. Blistering is a sign of a second degree burn. How sick you get when you are burned to blistering will depend on how much of your skin is that seriously burned. You can suffer shock from sunburn as well as from other kinds of burns.

The sensible way to get an enviable coat of tan plus the health benefit of the sun's rays is to take sunshine in small doses at first. Start with only a few minutes the first day and increase the dose by just a few minutes each day.

If you use one of the creams or lotions designed to protect against sunburn, remember that it will rub off, dry off and be washed off when you go in the water for a cooling dip or swim. So do not count on one application to protect you for too long a time.

Never look directly into the sun, no matter how dark your sunglasses, warns the National Society for the Prevention of Blindness. No glasses can keep out all the burning ultraviolet rays of the sun and these rays can actually burn the retina of the eye, causing permanent damage.

Be extra careful driving home at night after a day at the beach. Your eyes may be temporarily more sensitive to light, which means you cannot see as far at night as you ordinarily could. If you are driving 40 m.p.h., you could stop your car in 126 feet. This means you would avoid hitting an object just visible 130 feet away. But if the sun has temporarily weakened your vision so that you can only see the object 109 feet away, you may not be able to stop in time.

Science News Letter, July 19, 1952

BIOCHEMISTRY

More Copper, Less Iron In Blood of Cancerous

➤ THE VITAL metallic elements, iron and copper, are markedly changed in their concentrations in the blood serum of cancer patients as compared with the normal concentration in the serum of healthy people.

This is reported by Dr. Robert Pirrie, Muirhead Department of Medicine, Glasgow University, in the JOURNAL OF CLINICAL PATHOLOGY.

Dr. Pirrie measured the copper in the serum of 40 healthy and 19 cancer-stricken people and found that in those with cancer the copper content averaged more than twice as high as normal, but the iron was well below normal. This was true for all types of malignancies, those observed being as diversified as, among others, cancers of the lung, bone and breast.

Dr. Pirrie says it is not yet possible to assess the significance of the inverse effect of cancers on the serum copper and iron concentrations.

Science News Letter, July 19, 1952

INVENTION

Alarm Sounds If Tub Overflows

➤ IF YOU have a habit of wandering off after you have started to draw your bath and coming back only after the water has flooded the bathroom floor and ruined the plaster on the ceiling downstairs, what you need is a bathtub alarm patented by Nathan Polikoff, Brooklyn, N. Y.

The alarm, which operates on a dry cell battery, is mounted on the side of the bathtub. A float connects the electrical circuit when the water reaches a desired level, setting off a gong which can be heard throughout the house.

Provision is made so that the gong will not sound unless the alarm is actually attached to the side of the tub and the float moves up to the desired contact position. In other words, it will not go off at any other time except when a bath is being drawn and the alarm is in use.

Mr. Polikoff received patent number 2,602,846 for his invention.

Science News Letter, July 19, 1952

INVENTION

Algae Aid Separation Of Radiocarbon Isotopes

➤ CHLOROPHYLL, THE ubiquitous green agent of plants, plays an important part in a new method of separating the light and heavy radioactive isotopes of carbon used in medicine and research. The method was invented by Melvin Calvin and John W. Weigl, Berkeley, Calif., and assigned to the Atomic Energy Commission. Its patent number is 2,602,047.

The invention is based on the fact that organisms that contain chlorophyll use carbon dioxide to form complex organic molecules when they are exposed to the sun. The problem is to separate the heavier radioactive carbon isotopes, 13 and 14, from the lighter isotope, carbon 12.

The carbon dioxide containing a mixture of the isotopes is fed to algae, one-celled plants. The sun is allowed to shine upon them and photosynthesis takes place. The carbon dioxide containing the lighter isotopes is preferentially absorbed by the algae during the photosynthesis process. In this manner, according to the inventors, it is possible to separate the heavier from the lighter radioactive isotopes.

Science News Letter, July 19, 1952

METALLURGY

"Lost-Wax" Casting Produces Precision Parts

➤ A PROCESS of casting metal, described even in early Egyptian records, now is being used to produce precision parts for jet aircraft.

Known as the "lost-wax" or investment process, a wax model of the part to be cast is made from a master pattern. A liquid silica refractory is poured around the wax model and allowed to set. The whole business then is turned upside down and heated. The wax model melts and runs out, leaving the mold.

Molten metal is poured into the mold and allowed to cool. Afterward, the mold is broken open and the cast part is removed.

Describing the ancient process, a report from the Office of Technical Services, U. S. Department of Commerce, says the system was revived and expanded in recent years to produce dental castings and jewelry. It especially has been found valuable as a means of producing jet-engine parts that cannot be readily forged or machined.

By the process, intricate parts may be made of nonferrous metals as well as of cast iron and steel. The surfaces emerge smooth and have high dimensional accuracy.

Other processes can produce castings having these qualities. Other methods often are more economical. But the lost-wax method is best when it becomes too expensive or difficult to prepare small, intricate molds out of the materials in which parts usually are cast.

Science News Letter, July 19, 1952

NATURAL RESOURCES

Deep Freeze Locker

Permafrost, the Arctic's permanently frozen ground, presents problems in military construction, in farming and mining. The layer goes down 1,000 to 2,000 feet.

By WADSWORTH LIKELY

MILLIONS OF dollars worth of treasure are in a gigantic deep freeze "locker" built by Mother Nature.

The treasure is in all forms—mineral wealth, the profits on agricultural enterprises, anthropological and archaeological finds—and the permafrost of the Arctic prevents man from getting at it easily.

This permanently frozen ground of the northern part of North America also gets in the way of the free world's defenses. It makes problems for those who have to build air strips, radar stations and other military installations. Building roads over permafrost presents a special problem. Heated houses begin sinking into the ground as the heat slowly melts the permafrost, unless special engineering tactics are used.

The Russians have the same problem. A broad belt of permafrost exists in Siberia, sometimes going surprisingly far to the south. Russian geologists and engineers have studied this Siberian permafrost and Americans can make use of much of the Russian knowledge, published in the 1920's and 1930's before the Communists clamped down so tightly on exporting scientific knowledge.

A Shorthand Word

"Permafrost" is a sort of shorthand word with which the scientists, who like exactness, are not quite comfortable. It has been defined by one scientist as "a thickness of soil or other superficial deposit, or even of bedrock, at a variable depth beneath the surface of the earth in which a temperature below freezing has existed continually for a long time (from two to tens of thousands of years)."

Scientists would prefer the term "permanently frozen ground," or better still "perennially frozen ground." Some geologists have coined the words: "cryopedology, congeliturbation, congelifraction and "cryoplanation," each of which covers the subject with more precision, they think. However, "permafrost" has become popular, and "permafrost" it will probably remain.

Permafrost starts quite close to the surface, the top of it unfreezing in summer and freezing up again in winter. It has been known to go down as far as 2,000 feet —this in northern Siberia. In Alaska the greatest known depth is about 1,000 feet, south of Barrow.

The part which affects man most is what is called the active layer, that part which thaws in summer and freezes in winter. In it all plants are rooted, and all churning and soil movements take place. The active layer provides the peculiar ground surface characteristics which make permafrost regions easily recognizable.

No one knows exactly how permafrost got started. It is maintained, they know, because not enough heat gets into the ground from the sun during the summertime to keep the annual average temperature of the ground above the freezing point. Thus the ground stays frozen.

Scientists are asking each other whether this cold reserve is the result of the present climate or if it is left over from past, colder climates. Right now permafrost seems to be retreating northward, disappearing on its southward borders and growing thicker on its northern borders.

Constant slight changes in climate can change permafrost conditions in many areas. These changes, whether regional or local, can be brought about either by man or nature. It is the active layer which most concerns man.

When thawing or thawed in the summertime, the active layer is an unstable, waterlogged mass resting on the stable permafrost. Drainage of the excess water is not possible, no water can seep into the ground to provide stores of ground water. This material rests uneasily on its permafrost base and can creep and flow when a gentle slope is provided.

Man can change this. If he removes the covering of vegetable matter in order to farm, he destroys the insulation nature provided. Thus the sun can pour more heat into the ground. At agricultural experiment stations in Alaska, fields have become unusable after several years of farming because of the melting of large blocks of permafrost beneath the surface. Caverns or gullies form in cultivated fields.

Cultivation May Be Possible

Future studies, agriculturists hope, may develop principles for the farming use of the active layer so that fields are not destroyed or so that areas subject to caving and settling can be avoided.

During World War II, the armed forces encountered many difficulties in obtaining permanent water supplies and in constructing runways, roads and buildings in permafrost areas. The problem becomes even more important as our most likely enemy faces us across the North Pole.

With the emergence of these problems, American scientists realized that permafrost had been the greatest single deterrent to the settling of the northern part of Siberia.

ALASKAN RUNWAY—The caving and irregular settling shown in this picture took place in a gravel fill over thawing ice wedges at Umiat, Alaska. This and many other construction problems are the result of disturbing nature's deep freeze locker.

The Russians have worked long and hard on the problem, and Americans have been able to avail themselves of the Soviet findings.

The Russians found that it is a losing battle to fight the forces of frozen ground simply by using stronger materials in construction or by resorting to more rigid designs. They learned that construction designs should appreciably minimize or neutralize the destructive effect of permafrost. Frost forces are utilized to play the hand of the engineer rather than against him.

Used as Construction Material

Permafrost can itself be used as construction material but, if so, steps must be taken to see that it is kept frozen. If that cannot be done, it must be destroyed, and then steps taken to see that it does not come back.

All construction problems are individual and they depend on the nature of the permafrost. Is it expanding, is it stabilized, or is it being destroyed by nature? What kind of material is in the permafrost, how deep does it go? These are some of the questions the engineer has to answer for himself before he begins planning each individual construction job.

Artificial freezing, during a few hours on summer days, can be used to treat bad slides on roads and railroads, settling under expensive buildings, loosening of the foundations of dams, bridges and towers.

Scientists and engineers emphasize that much future research into the nature of permafrost is needed. The surface, literally and figuratively, has been barely scratched.

"As our civilization presses northward," says Robert F. Black, permafrost expert of the U. S. Geological Survey, "the practical needs of construction, water supply, sewage disposal, trafficability, and other engineering problems must be solved speedily and economically. Our present knowledge is relatively meager, and trial-and-error methods are being used too frequently."

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TECHNOLOGY

First Anti-Sub Sub Has Extra Sonar Gear

See Front Cover

➤ THE USS K-1, the Navy's first anti-submarine submarine, is shown on the cover of this week's SCIENCE NEWS LETTER. The sub recently visited Washington to give Navy officials a chance to see the latest developments in undersea warfare.

The boat is 195 feet long and displaces 750 tons. Her appearance differs from many other submarines because of the added sonar equipment, used to locate submarines by sound wave reflection, housed in the forward bulge.

Science News Letter, July 19, 1952

Chloromycetin Dangers Investigated After Death

➤ "QUITE A substantial number of deaths" were among the almost 300 cases of blood disorders found by the Food and Drug Administration among people who had been given the wonder drug, Chloromycetin (chloramphenicol).

Some of the cases of blood disorder have already been diagnosed as aplastic anemia. Experts are checking on the rest.

Whether they are actually due to the use of the first practical synthetic antibotic or merely a coincidence will be determined by a panel of physicians and blood experts to be called by the National Research Council's medical division. It was pointed out that several million people all over the world have been given Chloromycetin and, perhaps, thousands of lives have been saved by the new drug.

Physicians have been warned, in administering the drug, to watch for signs of disorders in the blood-forming functions of the body, particularly if the medicine is given over a period of time, or for a second time after a long interval.

It was pointed out that many of the new wonder drugs have side effects and physicians have learned to watch for them. A study will be made of such cases.

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ARAPAHO CHILD LIFE AND ITS CULTURAL BACKGROUND—Sister M. Inez Hilger—*Govt. Printing Office*, Bureau of American Ethnology Bulletin 148, 253 p., illus., paper, 75 cents. An Arapaho mother counts her baby's age in terms of his mental and physical development. She will say, "My child smiles," "My child walks," "My child speaks some words," or "My child is already able to think."

BACKGROUNDS OF HUMAN FERTILITY IN PUERTO RICO: A Sociological Survey—Paul K. Hatt—*Princeton University Press*, 512 p., paper, $5.00. Prepared under the joint auspices of the Social Science Research Center of the University of Puerto Rico and the Office of Population Research of Princeton University to throw light on the attitude patterns which affect fertility on the island.

BIOLOGY, ITS HUMAN IMPLICATIONS—Garrett Hardin—*Freeman*, 2d ed., 720 p., illus., $5.00. A text for the student who is taking what may be his only course in this science as well as the future specialist.

CATALOGUE OF THE CENOZOIC PLANTS OF NORTH AMERICA THROUGH 1950—Robert S. Lamotte—*Geological Society of America*, 381 p., $5.50.

A CLASSIFICATION OF THE CONULARIDA—G. Winston Sinclair—*Chicago Natural History Museum*, 11 p., illus., paper, 20 cents. Describing some diagnostic features that will aid in preparing a more adequate attempt at classification of this shell.

DEVELOPMENT OF RAPID METHODS OF SOAKING AND COOKING DRY BEANS—Elsie H. Dawson and others—*Govt. Printing Office*, USDA Technical Bulletin No. 1051, 53 p., paper, 20 cents. Government scientists have found out how to cook beans after only a one-hour soaking instead of overnight.

DISTRIBUTION OF EVOLUTIONARY EXPLOSIONS IN GEOLOGIC TIME: A Symposium—Lloyd G. Henbest, Ed.—Paleontological Society, 96 p., illus., paper, $2.00. Discussing the rise and fall of ancient groups of organisms and methods of dating them.

DU PONT, THE AUTOBIOGRAPHY OF AN AMERICAN ENTERPRISE: The Story of E. I. Du Pont de Nemours & Company Published in Commemoration of the 150th Anniversary of the Founding of the Company on July 19, 1802—E. I. Du Pont de Nemours & Company—*Scribners*, 138 p., illus., $5.00. A beautiful record of what has happened to a great American company over a century and a half.

EARLY DEVONIAN FISHES FROM UTAH: Part I, Osteostraci—Robert H. Dension—*Chicago Natural History Museum*, 23 p., illus., paper, 50 cents. These fishes are the first vertebrates of this age discovered in the United States.

ENMERKAR AND THE LORD OF ARATTA: A Sumerian Epic Tale of Iraq and Iran—Samuel Noah Kramer—*University Museum*, 55 p., illus., paper, $1.00. It was the ancient Sumerians who created the epic poem. Here is a tale of a hero who lived about the first century of the third millennium B. C.

AN EXPLORER-SCIENTIST'S PILGRIMAGE: The Autobiography of William Herbert Hobbs—William Herbert Hobbs—*J. W. Edwards*, 222 p., illus., $3.75. An authority on glaciers, earthquakes and volcanos describes his eventful life during which he explored the polar regions and other remote parts of the world.

FABRIC FACTS VERSUS NEW NAMES—Jules Labarthe, Jr.—*Mellon Institute*, 4 p., paper, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. Those who buy new fabrics will be interested in this article on what is really known about the new fibers.

THE FAMILY PROBLEMS HANDBOOK: How and Where to Find Help and Guidance—Arnold W. Holmes—*Fell*, 191 p., paper $2.00, cloth $3.50. Advice on a great variety of questions that may come up in the home from bed-wetting to mothers-in-law and old age assistance.

GERMANY'S NEW NAZIS—Anglo-Jewish Association—*Philosophical Library*, 76 p., paper, $2.75. Report of an investigation conducted by the Foreign Affairs Committee of A.J.A. The conclusion is that Germany has a fundamentally healthy social structure which is, nevertheless, far from completely stable.

GENERAL GENETICS—Adrian M. Srb and Ray D. Owen—*Freeman*, 561 p., illus., $5.50. An introductory text emphasizing the biological implications of genetics.

GUIDING CHILDREN'S ARITHMETIC EXPERIENCES: The Experience-Language Approach to Numbers—J. Allen Hickerson—*Prentice-Hall*, 322 p., illus., $6.65. A book for teachers to aid them in making numbers and mathematical concepts meaningful to children.

A HOME PROGRAM FOR PATIENTS AMBULATORY WITH AIDS—Edward E. Gordon—*National Multiple Sclerosis Society*, 19 p., illus., paper, free to any multiple sclerosis patient upon request by physician to the publisher, 270 Park Avenue, New York 17, N. Y. Telling patients how to build up weakened muscles and loosen tight muscles through special exercises, daily activities and hobbies. One of four such manuals; the others are for independently ambulatory patients, wheel chair patients and more confined patients.

HOPEWELLIAN COMMUNITIES IN ILLINOIS—Thorne Deuel, Ed.—*Illinois State Museum*, 271 p., illus., paper, $3.50. A series of papers descriptive of these ancient Americans, famous for the huge mounds they erected.

THE INDIAN CASTE OF PERU, 1795-1940: A Population Study Based Upon Tax Records and Census Reports—George Kubler—*Govt. Printing Office*, Institute of Social Anthropology Publication No. 14, 71 p., illus., paper, 75 cents. An almost complete lack of knowledge concerning population growth among the Indians of Peru was remedied with the finding of old tax records.

JOURNAL OF AN EXPEDITION TO THE MAUVAISES TERRES AND THE UPPER MISSOURI IN 1850—Thaddeus A. Culbertson, edited by John Francis McDermott—*Govt. Printing Office*, Bureau of American Ethnology Bulletin 147, 164 p., illus., paper, 75 cents. A historic document of an early trip of exploration up the Missouri.

NATIONAL PHYSICAL LABORATORY REPORT FOR THE YEAR 1951—*Her Majesty's Stationery Office*, 77 p., paper, 75 cents. The official report of research conducted during the year.

A NEW LEPTODACTYLID FROM CHILE—Karl P. Schmidt—*Chicago Natural History Museum*, 5 p., illus., paper, 10 cents. Two specimens of this frog are gifts of Dr. D. S. Bullock, of Chile.

NOTES ON BIRDS FROM THE MARCAPATA VALLEY, CUZCO, PERU—Melvin A. Traylor, Jr.—*Chicago Natural History Museum*, 7 p., paper, 10 cents. Based on collections recently sent to the museum.

PALATABILITY AND NURITIVE VALUE OF HOME-CANNED CHICKEN PREPARED BY DIFFERENT METHODS FOR PROCESSING—Gladys L. Gilpin and others—*Govt. Printing Office*, USDA Technical Bulletin No. 1054, 36 p., paper, 15 cents.

PRINCIPLES OF HUMAN RELATIONS: Applications to Management—Norman R. F. Maier—*Wiley*, 474 p., $6.00. To aid the officers of industry in preventing misunderstandings and developing smooth relations through democratic administration. Instructions for giving training in human relations are included.

REFERENCES TO THE TUATARA IN THE STEPHEN ISLAND LETTER BOOK—Karl P. Schmidt—*Chicago Natural History Museum*, 10 p., illus., paper, 20 cents. Notes on a lizard-like reptile, now almost extinct, and living only in New Zealand.

RENAL FUNCTION: Transactions of the Third Conference—Stanley E. Bradley—*Josiah Macy, Jr., Foundation*, 210 p., illus., $3.50. Bringing together men from various branches of science to discuss this common problem.

RESOURCES FOR FREEDOM—President's Materials Policy Commission—*Govt. Printing Office*, illus., paper, Vol. I, Foundations for Growth and Security, 184 p., $1.25; Vol. II, The Outlook for Key Commodities, 210 p., $1.50; Vol. III, The Outlook for Energy Sources, 43 p., 50 cents; Vol. IV, The Promise of Technology, 228 p., $1.75; Vol. V, Selected Reports to the Commission, 154 p., $1.25. Of great interest to those who want to know what lies ahead.

THE SCIENTIFIC PAPERS OF JAMES CLERK MAXWELL—W. D. Niven, Ed.—*Dover*, 1488 p., illus., $10.00. This edition is complete and unabridged from the edition of 1890. Scientists and students alike will enjoy reading in Maxwell's own words accounts of the problems he solved.

TRANSACTIONS OF JOINT MEDICAL-LEGAL CONFERENCE SIXTEENTH ANNUAL MEETING: A Panel Discussion on Administration of Workmen's Compensation Laws—A. J. Lanza and others—*Industrial Hygiene Foundation*, 46 p., paper, 75 cents.

ULTRASONIC PHYSICS—E. G. Richardson—*Elsevier*, 285 p., illus., $5.00. Telling what has been accomplished in this new science, with emphasis on the ultrasonic interferometer as a precision laboratory tool.

UNITED STATES PARTICIPATION IN THE UNITED NATIONS—Report by the President to the Congress—*Govt. Printing Office*, 324 p., paper, 65 cents. "The United Nations," says the President, "has been the mainstay of our work to build a peaceful and decent world."

VOCATIONAL SERVICES FOR PSYCHIATRIC CLINIC PATIENTS—Thomas A. C. Rennie and Mary F. Bozeman—*Harvard University Press*, 100 p., paper, $1.25. Results of a study to determine the exent to which patients in psychiatric outpatient clinics have vocational problems. About 79 per cent do.

WOODWORK FOR THE BEGINNER—Franklin H. Gottshall—*Bruce*, 139 p., illus., $4.00. Suitable for use in classes in woodworking, the directions for making simple articles for the home do not assume any previous experience in any of the operations involved.

WORLD NEIGHBORS WORKING TOGETHER FOR PEACE AND PLENTY: Report of the First National Conference on International Economic and Social Development—Thomas B. Keehn, Chairman—*First National Conference*, 198 p., illus., paper, $1.00. The purpose of this conference was to consider the challenge provided by the billion people living in underdeveloped areas and the possibilities created by Point IV.

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Untreated *pilings* in British Columbia coastal waters sometimes have been eaten through and rendered useless in a year's time by marine borers, more destructive to timbers than decay.

AERONAUTICS

Helicopters in Arctic

➤ THE EVER-EXPANDING field of usefulness of the helicopter will soon include rescue work in the arctic where weather and terrain make operations with ground equipment or ordinary airplanes difficult or impossible.

For this purpose, the Royal Canadian Air Force is getting six special craft built by the Helicopter Corporation of Morton, Pa.

The type ordered is the H-21A Work Horse which can operate in temperatures down to minus 65 degrees Fahrenheit, is capable of long-range operations and has space for 12 litters or 14 seats in addition to its two-man crew.

Its heating system not only keeps the cabin warm but also warms up the engine, transmission and controls. It is powered by a Wright Cyclone 9 engine, said to be the largest engine ever installed in a production model helicopter.

When the first helicopters were developed many experts saw little of practical value in them and predicted that they would not be important in aviation. But the war in Korea has proved differently. There helicopters are doing valiant work in removing wounded men to the rear, rescuing trapped men, delivering troops and equipment to forward positions and serving in reconnaissance.

Important as the helicopter has proved itself in military affairs, it will probably play an even more important part in civilian activities. It is already in successful use in delivering mail from central postoffices to others in the neighborhood.

One probable job, when more helicopters are available, is to serve as feeders from neighboring cities to transcontinental and other airways and the airliners that travel these routes.

Early helicopters were one-man craft. Helicopters that carry a dozen men are now common, and ones large enough to carry twice the present passenger load are under construction.

What is reported to be the largest helicopter yet built is the jet-powered XH-17, constructed by the Howard Hughes aircraft company and now undergoing ground tests, which is designed for cargo carrying. Particularly suitable for the short-range moving of heavy military equipment, in operation it will straddle its cargo much as the lumber lift used in timber straddles a heavy log.

Science News Letter, July 19, 1952

ENTOMOLOGY

Coals to Newcastle—Beetle to South Pacific

➤ LIKE SHIPPING coals to Newcastle, the University of California recently airmailed 50 live Vedalia beetles to the Samoan Islands in the far South Pacific to fight the cottony cushion scale.

It was just 64 years ago, 1888 to be exact, that a similar scale infestation was wiped out in California when the U. S. Department of Agriculture imported the one-eighth-inch-long beetles from Australia.

At that time the cottony cushion scale was completely controlled and there has been no trouble since 1888—except in recent years following application of DDT and other new organic insecticides for control of other pests. Use of these insecticides destroys the beetles and thus permits the scale to increase to destructive levels.

The predatory beetles are sent in special, flat boxes of porous wood, so light they may be put in envelopes and air mailed readily to distant parts of the globe.

The Vedalia beetle has been distributed to 65 different countries and geographical areas of the world since 1890.

Science News Letter, July 19, 1952

PSYCHOLOGY

Skid Row Bum Worries

➤ THE BUM on Skid Row is not the carefree individual that people sometimes think. As a matter of fact he has many more worries than does the typical business man.

This was revealed when a team of scientists of the Illinois Institute of Technology in Chicago interviewed derelicts, criminals and psychotics found in a mission. Results were compared with those obtained from business men contacted in their offices, hotel lobbies and restaurants of the Loop district, and from a group of psychologist colleagues.

The different groups worry about different things.

The Skid Row "bum" is worried about his personal appearance to a much greater extent than is the business man or the scientist. And the peak of his worry on this score comes later in life than for the others.

The psychologist worries more about politics, religion and philosophy than either the business man or the bum. Nine out of ten psychologists are concerned about religion as compared with only four out of ten business men. The business man is ten years older before he is concerned about politics than either psychologist or derelict.

The Skid Row man is more likely to be worried about sexual morality and marital difficulties than either of the other groups, and his sex worries come later in life. The Skid Row denizen worries more about the neighbors and relatives.

All the men interviewed had their economic worries, but for the Skid Row men this kind of worry covered a much greater part of their lives.

The business man has much fewer worries about confidence in meeting people and giving up important hopes and ambitions.

Details of the study are reported by Drs. R. A. Dykman, E. K. Heimann and W. A. Kerr. Dr. William Seath of the Chicago Christian Industrial League obtained the data on the men from Skid Row.

Science News Letter, July 19, 1952

BIOPHYSICS

Radioactive Adrenals

➤ TWO ADRENAL gland hormones, one of them a close relative of cortisone, are going to be "manufactured" in radioactive form for research. The work will be done at the Worcester, Mass., Foundation for Experimental Biology under a $19,800 grant from the U. S. National Institute of Arthritis and Metabolic Diseases, Bethesda, Md.

Hydrocortisone, or Compound F, and corticosterone, or Compound B, are the two which will be made in radioactive form. Radio-hydrocortisone will be made by the perfusion method in which a radioactive sex hormone, progesterone, will be passed through numerous beef adrenal glands.

In some cases of arthritis, hydrocortisone is more effective than cortisone when injected directly into inflamed joints. Cortisone's action may, some scientists think, be due to its similarity to hydrocortisone which is more commonly found in the body.

Corticosterone has proved useful in research on Addison's disease. But the ways in which these two gland chemicals produce their effects in the body are still a "mystery." Tracer studies with the radioactive forms are expected to give knowledge which eventually should help the millions of arthritics as well as Addison's disease sufferers.

The material is expected to be ready within a year. Dr. Gregory Pincus of the Worcester Foundation is in charge of the work. Scientists wanting some of the material for research must submit formal research proposals to the National Institute of Arthritis and Metabolic Diseases.

Science News Letter, July 19, 1952

VETERINARY MEDICINE

Better Health For Sick Pets

➤ DOGS, CATS, parrots and other pets are being helped to recovery from illness and accidents, often by the same methods used to help their owners when they get sick. At the meeting of the American Veterinary Medical Association, the following advances were reported:

X-ray treatment is now saving or prolonging the lives of many sick pets which formerly would have had to be destroyed or would have died early deaths.

Dr. Mack A. Emmerson, head of the department of obstetrics, and radiologist at Iowa State College, Ames, Iowa, said that it "is now a definitely established part of veterinary science in this country and should develop rapidly in the future."

Some diseases which Dr. Emmerson reported treating with X-rays include: sore feet of a great Dane, swelling of the lymph glands in a dog (life of dog prolonged three years), beak tumor in love bird (pet's life prolonged 18 months), ear growth in Boston terrier female, nasal tumor in a Boston terrier (cured), body tumor and swelling in a seeing-eye dog (cured).

As is the case with human beings, a dog's spinal column sometimes goes out of whack, too, and when this happens, Rover may be in for all sorts of trouble. Dr. B. F. Hoerlein of the Alabama Polytechnic Institute, described one type of canine spinal problem, the condition known as protrusion of the intervertebral disk.

When this happens, the dog may develop symptoms of pain and muscle spasms, partial paralysis of the body or an acute form of progressive paralysis and death. Sometimes the dog will get better by itself, but generally treatment is required, Dr. Hoerlein said.

Treatment of two kinds may be used, he said—medication and symptomatic care, or a surgical operation. Both methods have been used with good success, but he emphasized that when symptoms of this trouble develop, treatment should be started early to avoid needless pain and distress to the dog.

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Questions

AERONAUTICS—How much safer is it to fly today than in 1931? p. 36.

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MARINE BIOLOGY—What is the cause of the "red menace" in Chesapeake Bay? p. 39.

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MEDICINE—What is one of the highest temperatures observed in human beings? p. 38.

How can taking a cough remedy act to stop a cough? p. 38.

• • •

METALLURGY—What is "lost-wax" casting? p. 41.

• • •

NATURAL RESOURCES—What is permafrost? p. 42.

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PSYCHIATRY—Who is likely to develop "nostopathy"? p. 37.

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VETERINARY MEDICINE—What is one of the causes of X-disease in cattle? p. 41.

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Photographs: Cover and p. 37, Fremont Davis; p. 35, National Bureau of Standards; p. 38, California Institute of Technology; p. 39, Australian Official Photograph; p. 42, U. S. Geological Survey.

PHYSICS

Spark Less in Summer

High summer humidity covers material with thin moisture film that dissipates electrostatic charges that otherwise can build up to cause sparks.

➤ CHANCES ARE you do not spark as much in the summer as in the winter. But it is not the heat, it is the humidity.

Romantic notions aside, the sparks referred to here are created by static electricity. It may be generated when you slide out of your automobile across plastic seat covers. It may be generated when you walk on a thick rug.

High summer humidity covers materials with a thin moisture film. The film, combined with impurities on the materials, provides a short-circuit path for the static electricity, thus preventing sparks. Heat has nothing to do with it.

But in the winter, when cold air is warmed in your house, its relative humidity drops. The moisture film vanishes. You sometimes get shocked when you touch various household objects.

The most practical way to reduce static in the home is to increase the relative humidity to about 50% by humidifiers, says Francis L. Hermach, who heads the National Bureau of Standards' research section on the subject.

Static electricity becomes a hazard in many places. Hospitals, for instance, cut chances of explosions of the anesthetics used in operating rooms by installing floors of moderately low electrical resistance, and by requiring personnel to wear rubber-soled shoes. The rubber soles have carbon black in them that carries off the static charge.

When static charges may be dangerous in stationary objects such as grain elevators, sometimes the entire building is connected together, electrically speaking. Where moving things are involved, current-carrying floors are used to reduce chances of spark-caused explosions.

If you are charged to about 300 volts, you might spark when you touch some other object, but you cannot hear, see or feel the spark. When the voltage reaches 1,000, you can feel it. When it reaches 5,000 volts, your nervous system gets quite a jolt.

But although the voltages are high, the amount of energy in the spark is low. Static electricity in the home ordinarily creates no danger to human life. A few exceptions do exist, but Mr. Hermach says they are so rare the Bureau disregards them.

Currently the National Bureau of Standards is conducting research on static electricity for various governmental agencies. Its object is to find standards that may help to reduce hazards from static electricity.

Science News Letter, July 19, 1952

PSYCHOLOGY

Gambling Habit Strong In Winners and Losers

➤ THE GAMBLING habit is much stronger in those who have had the experience of both winning and losing than it is for either the habitual winner or the steady loser. The steady winner is the first to quit the game when he begins to lose.

This was observed in watching the behavior of six- and seven-year-old boys who won and lost little plastic cowboys and football players, playing a push button machine. The boys all believed the game was honest; none had any idea that the machine was rigged.

Each boy started play supplied with 20 toys. On each play, he would put up one of his toys. The scientist-"croupier" also put up one. If the boy won, he got both toys; if he lost, both went into the "croupier's" bag. The boys were permitted to quit the game whenever they wanted to.

Strength of the gambling habit was measured by the number of times the boy was willing to play after he ceased to win.

One group was permitted to win ten times running before their losing streak started. Although they then had ten more toys than they had to start with, they were ready to quit when they had lost eight of them. The two groups who won half the time and six times out of ten were the most confirmed gamblers. They were not ready to give up until after 15 or 16 losses running. A fourth group that was never permitted to win, nevertheless kept on playing until the boys had lost half of their toys before they were ready to quit.

Details of the experiment, which was conducted among school children of Inglewood, Calif., is reported by Dr. Donald J. Lewis, now of George Washington University, Washington, D. C., to the JOURNAL OF EXPERIMENTAL PSYCHOLOGY (June).

Science News Letter, July 19, 1952

Do You Know?

The stomach lining has more than 5,000,000 tiny *glands.*

Citronella is a giant grass that is grown easily and inexpensively in Ceylon.

California grows about 80% of the United States' *garlic* crop.

Television *antennas* are good lightning targets; they should be properly grounded.

Aspirin does not preserve cut flowers if dissolved in the water into which the flowers are placed.

Juniper scale from the United States slipped through Bermuda's plant quarantines and has infected almost a million trees.

After boring through the twigs, caterpillars or worms of the *oriental fruit moth* later attack ripening peaches.

• New Machines and Gadgets •

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N ST., Washington 6, D. C., and ask for Gadget Bulletin 631. To receive this Gadget Bulletin without special request each week, remit $1.50 for one year's subscription.

➤ *BEVERAGE PITCHER that can be filled to the brim with 2½ quarts of cool summer drinks remains relatively easy to lift because of its light-weight plastic construction. A baffle in the pitcher's mouth prevents ice cubes from rattling out and splashing into the glass being filled.*

Science News Letter, July 19, 1952

➤ *ONE-WAY VIEWER for door allows persons inside to see who is outside the door, yet keeps the caller from knowing he is being looked over. Made of plastic, the unit is 1¼ inches in diameter and fits doors up to two inches in thickness. Its shatterproof lens magnifies and gives an extra wide-angle field of vision.*

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➤ *TRAINER FOR automobile drivers allows the student to practice realistically nearly all of the manipulations associated with driving a car. Instead of using a movie to show the trainee what conditions he is encountering, a moving belt just ahead of the steering wheel simulates the road ahead. A miniature car mounted on the belt responds to the trainee's "driving."*

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➤ *SHOWER TESTER for industrial plants permits safety engineers to stay dry while*

testing showers installed to quench clothing fires that might occur in the laboratory. A vertical assembly funnels water from the sprinkler into a can, as shown in the photograph, and a connecting hose carries the water to a nearby sink, thus protecting the clothing of the testing engineers.

Science News Letter, July 19, 1952

➤ *BELL-LIKE SHOWCASE for family heirlooms is made of clear plastic that fits into a mahogany or ebony base. The covering stands 4¼ inches high and has an outside diameter of 3½ inches. The "treasure dome" is designed to protect, as well as to enhance, items displayed within it.*

Science News Letter, July 19, 1952

➤ *GOLF-BALL SPRAY, applied directly from its can, whitens old golf balls and makes them as bright as ever. The container holds enough of the solution to treat 70 balls. A hand-held wire holder is used to suspend the ball in the path of the quick-drying spray.*

Science News Letter, July 19, 1952

➤ *CARPET-JOINING TAPE with built-in metal grips uses, in addition to the grips, a tough rubber-based adhesive to join carpet sections quickly and securely. Seams can be made without turning the bulky sections over.*

Science News Letter, July 19, 1952

➤ *FUSEHOLDER THAT takes standard panel-size fuses has a built-in neon light bulb that lights up instantly when the fuse blows, thus making it easy to spot the bad fuse. Spent fuses are easily replaced from the front of the panel.*

Science News Letter, July 19, 1952

• Nature Ramblings •

➤ "THOSE AWFUL long Latin names" are often offered as an explanation of reluctance to study botany or zoology.

Yet the same person who gives this excuse will, without hesitation, order chrysanthemums, cinerarias or geraniums from the florist, or go out into the garden to plant nasturtiums, delphiniums and campanulas, or to prune philadelphus, forsythia and rhododendron bushes in the shrubbery.

We manage all right with the long names we know; the unfamiliarity of new names, rather than their length, would seem to be the real stumbling-block.

Many of the botanical names that have been taken over "as is" into our common garden English are short even if Latin—or, more frequently, Latinized Greek. Among them are iris, phlox, dahlia, azalea, salvia, yucca, trillium, cosmos, geum, smilax, clematis, silene, lychnis, and dozens of others.

Many other botanical names were the common names by which the ancients knew the same plants, were adopted as

"Calling Names"

scientific names by early modern botanists, and have come over into English slightly modified—frequently by passage through French or Italian.

Thus Rosa was turned into rose, Viola into violet, Pisum into pea, Pinua into pine, Ulmus into elm, Papaver into poppy, Mentha into mint, and so on. A most interesting sequence is from Greek Lirion into Latin Lilium, thence into English lily.

The advantage to the scientist of botanical names over common names is that the former are governed in part by rules established by international congresses of biologists and are thus uniformly regulated and the same all over the world.

Some botanical names are actually shorter than their English opposites. It takes less time to say Nymphaea than it does to say water-lily, Convalleria than lily-of-the-valley, Smilacina than false Solomon's seal, Specularia than Venus' looking-glass.

A few of the long plant names have been cut down to monosyllables by florists for convenience in reference and display advertising, like "mums" for chrysanthemums and "glads" for gladioli.

The surprising thing is that there are so few such trade terms. You never hear geraniums called "yums," or centaureas referred to as "cents," or aspidistras shortened to "asps."

Science News Letter, July 19, 1952